

**Patent Claims**

1. A nucleic acid molecule which is selected from the group consisting of
  - a) nucleic acid molecules which encode a polypeptide which comprises the amino acid sequence disclosed by SEQ ID NO: 2;
  - 5 b) nucleic acid molecules which contain the sequence depicted by SEQ ID NO: 1;
  - c) nucleic acid molecules whose complementary strand hybridizes with a nucleic acid molecule from a) or b) under stringent conditions and which exhibit the biological function of a photoprotein;
  - d) nucleic acid molecules which differ from the nucleic acid molecules mentioned under c) due to the degeneracy of the genetic code;
  - 10 e) nucleic acid molecules which exhibit a sequence homology with SEQ ID NO: 1 of at least 95% and have the biological function of a photoprotein; and
  - f) nucleic acid molecules which exhibit a sequence homology with SEQ ID NO: 1 of at least 65% and have the biological function of a photoprotein.
- 15 2. A nucleic acid as claimed in claim 1 which contains a functional promoter 5' to the photoprotein-encoding sequence.
3. A recombinant DNA or RNA vector which contains a nucleic acid as claimed in claim 2.
4. An organism which harbors a vector as claimed in claim 3.
5. An oligonucleotide having more than 10 consecutive nucleotides which is identical or  
20 complementary to a constituent sequence of a nucleic acid molecule as claimed in claim 1.
6. A polypeptide which is encoded by a nucleic acid sequence as claimed in claim 1.
7. A method for expressing the photoprotein polypeptide as claimed in claim 6 in bacteria, eukaryotic cells or in *in-vitro* expression systems.
8. A method for purifying/isolating a photoprotein polypeptide as claimed in claim 6.
- 25 9. A peptide having more than 5 consecutive amino acids which is recognized immunologically by antibodies directed against the photoprotein bolinopsin.

10. The use of a photoprotein-encoding nucleic acid as claimed in claims 1 to 3 as a marker gene or reporter gene.
11. The use of a photoprotein as claimed in claim 6 as a label or reporter.